

CHANGING EXPECTATIONS FOR THE INDOOR ENVIRONMENT -  
AN OCCUPATIONAL PHYSICIAN'S VIEW

INTRODUCTION

My presentation is concerned and confined to changing expectations for the indoor office environment in the UK, of which I have some experience qualifying me to speak. However, world wide concern for the quality of the indoor environment deserves much more than any passing reference I can make and therefore I hope that this very important subject is covered by our other speakers. Indoor Air International, an international learned society for promotion and research into indoor environmental quality, has a world wide membership actively concerned with these aspects and I understand that their literature is on display.

Turning now to my smaller specialised field of concern, I should state that I am indebted for much of my presentation to Martha Whitaker of HOK architects.

How are expectations changing? - through evolving work methods made possible by, and stimulating production of, new technology.

Why are they changing? - Because of demographic factors, the accelerated pace of change and the need for quality to attract and satisfy markets.

When are they changing? - Now and through the 90s.

We are into 'The age of Unreason' (Charles Handy). The pace of life has accelerated from incremental to discontinuous change, only predictable by Catastrophe Theory, with continuously adaptable thinking required to meet different and changing challenges.

Where are they changing? - In all workplaces, especially new sites and offices, with a drift from the cities into urban, country and home working.

The link between a person's place of work and their home can now be broken. Electronics allows us to disperse away from cities toward rural areas. Telecommunications permit us to work with a business associate in a New York office and a rural location in Wiltshire. We are witnessing the linking of Europe, North America and the Pacific Rim to form a golden triangle of free trade.

FACTS

Every day, 3 million people fly from one place on the planet to another. 1 billion passengers fly the worlds airways each year. It is estimated that by 2000, it will be 2 billion passengers - double the 1990 figure.

The Economist, a British publication, is read by people in 170 countries. Only one quarter of its readers are in Great Britain. The Financial Times, the Economist, the Wall Street

Journal, Time, Newsweek, Diezeit of Hamburg, China Daily are each published on the same day on several continents.

More than 80% of all information stored in the more than 100 million computers around the world is in English.  
("Megatrends 2000" John Naisbitt).

WHOSE EXPECTATIONS ARE CHANGING? - The working population - now divided into:

Core workers - qualified professionals on high salaries, giving expertise, commitment and flexibility. Their numbers are decreasing.

Contracted out, on demand, 'consultants' - technical, professional and others. Their numbers are growing as organisations exploit and export uncertainty.

The flexible labour force - part-time and temporary. The fastest growing sector.

Success goes to "Triple I" organisations that have:

The Right Equipment, People and Environment, with Intelligence, Information and Ideas with entrepreneurial leaders in Small task forces, in Networks, 'Planet & Satellites' and Flat Pyramids ("Second guessing" middle managers are OUT!)

The concept of 'total quality' travelled from the post World War II U.S.A. gurus Juran and Denning to Japan and then from Japan to the Far East, the U.S.A. and Europe.

Now audits produce objective evidence of need for change requiring new work methods.

#### THE INDUSTRIALISATION OF THE OFFICE.

In the UK during the period 1989/91 there were 972 office accidents with more than three days of lost time, plus 181 major accidents.

50% of people working in offices now have access to computers.

#### The Present Typical British Office (Paul Appleby's caricature)

Dust, carpet mites, static.  
Cleaning fluids, formaldehyde, 'gassing' odours.  
'Drafts' or 'stuffy'.  
Machines everywhere: noise, vibration, heat, chemicals.  
Glare: sun, off VDUs, solar heat gain.  
Noise and vibration from outside.  
Tobacco smoke and BO.  
Physical discomfort from chair and desk.  
Cables: danger, nuisance.  
Air conditioning: external and plant source contaminates.  
Absent employee: motivated - moved to better job. Demotivated - off sick!

A few slides to illustrate classical air-conditioning 'horrors':

- 1 Blocked ventilation grill affecting air-flow balance through ventilation system.
- 2 Fluffy dust in extract system (dust in the supply system is finer as the air has been through a filter).
- 3 Slime in water tank.
- 4 Dead cat in water tank!  
(By courtesy of Rentokil Limited, East Grinstead).

Are these 'Hygiene Factors' important for productivity?

You will recall that Herzberg showed in his classic study that whilst these factors do not motivate, their absence can demotivate - unless there is a good reason understandable by the work force.

In the Falklands conflict British troops 'yomped' to Stanley in terrible conditions because they knew that their helicopter transporters had been sunk. Although they had exhausted their artillery ammunition they then forced the Argentines to surrender!

10 ways to check the morale in your Company:

**Morale is bad if:**

The managing director never smiles

No-one knows the name of anyone else

Senior managers only communicate in print

The windows are impossible to open

The only person who knows everything is the office cleaner

**Morale is good if:**

The managing director can afford a new Jaguar

Outsiders are welcomed rather than met with dour suspicion

People have an idea of what they'll be doing in five years time

There's plenty of bustle

The washrooms have fresh soap and towels

(Charles Jennings, British Rail Magazine)

**GREEN ISSUES OF THE NINETIES**

By the end of the 20th Century, scarce young professionals almost certainly with 'green' expectations will be attracted to "Triple I" organisations with

The right

- Equipment
- People
- Environment

Pressure from staff for greener and healthier buildings will continue to grow as awareness of potential problems increases.

"Greening" a building often makes economic sense for the operator as well as being environmentally desirable.

Particular targets for "Greening" buildings will be lighting, heating and air-conditioning, and the choice and design of building components.

The environmental reputation of a company - partly judged by its premises - will play an increasing part in people's choice of employer, especially among the young and skilled who are likely to be especially scarce as the decade progresses. Following EC directives UK legislation should lead to user friendly work stations, machines, softwear, workloads and psycho-social atmospheres.

Falling office rents should release funds for optimum internal environments to meet the expectations of an increasingly scarce, young and skilled workforce, who will expect clean air free from pollutant effects, and the ability to vary their lighting, heating, humidity and noise levels in an individually controlled micro climate.

Fifty years ago the American social philosopher, writer and teacher Lewis Mumford stated that it was:-

"Time for architects to come back to earth and make a new home for man".

Only now are ecology and planetary incentives succeeding where William Morris, the Arts and Crafts Movement and Frank Lloyd Wright failed.

Only now are we realising that architecture is far too important to be left to the architects. They and the designers are now remembering that the sun shines and the wind blows and rediscovering daylight, fresh air and trees.

In the 60s and 70s speculative builders gave us sealed office boxes and the sick building syndrome. But in the late 80s we learned about the greenhouse effect, the ozone layer threat and the global destruction effects of depleting and burning rain forests.

A psychological awakening has resulted and in the last three years architects have begun to ask prospective occupants what kind of buildings they want to work in rather than tell them what they can have.

#### THE RISE OF TECHNICAL AND PROFESSIONAL EMPLOYEE POWER

##### 1 Technical and Professional growth rates in USA

are projected to exceed 20% during the next decade:-

#### Projected growth rate by Occupations

	1984	2000	% change
Total Employment	106,843 M	122,760 M	14.9%
Exec., Admin., Managerial	10.6%	11.2%	<u>22.1%</u>
Professional workers	12.0%	12.7%	<u>21.7%</u>
Technicians & Support	3.0%	3.4%	<u>28.7%</u>
Salesworkers	10.5%	10.9%	<u>19.9%</u>
Admin. Support, incl. Clerical	17.5%	16.7%	(-9.5%)
Private household workers	0.9%	0.7%	-18.3%

Service workers Production, Craft, Repair)	14.6%	15.4%	21.3%
Workers ) Operators, Fabricators, )	11.4%	11.1%	11.7%
Labourers )	16.2%	15.2%	7.3%
Farming, Forestry, Fishing	3.3%	2.8%	-3.0%

Source: US Bureau of Labour statistics

In the UK similar trends are leading to changes in management practices. Flexible employee assistance programmes, intrinsic reward systems, team building, and programmes that will allow employees greater input are becoming increasingly common.

## 2 Shareholding

Open attitudes, a business environment that liberates talent and rewards success, job enrichment and an end to the 'them and us' mentality are what industry needs more than anything. Encouraging employees to become shareholders in their own firms is one important way of bringing this about. Shareholders have certain rights: they have the right to question decisions and hold management to account. So if we want our employees to behave as 'owners', if we want to broaden their contribution to the success of our firms - and link their remuneration more closely to results - we must recognise that the days of the 'master/servant' relationship are over. (Robert Horton, Chairman BP, CBI National Conference November 1991). BP has just appointed their first female non-executive director.

## 3 Employee Pensions Councils

Will strengthen in the wake of the Maxwell and Mirror Group scandal, possibly backed by legislation.

## 4 New Statutory Obligations for Employers

- 4.1 The Control of Substances Hazardous to Health (COSHH) regulations - the development of the 'Health' aspects of the Health and Safety at Work Act. Proposed amendments will give greater emphasis to the prevention of exposure to carcinogens at work by substitution and enclosure. Regular reviews of assessments and an increase of Health Surveillance and Record Keeping for all hazardous substances from 30 to 40 years is also proposed.

Illustrating the increasingly apparent authority of these regulations, stemming as they do from the old Factories Acts and revitalised by the European Directives in the Treaty of Rome, it was recently reported that the Managing Director of a Jarrow Company had been fined £4,000 plus costs for failing to follow his Company Policy on asbestos removal. Jail next?

- 4.2 The recommendations on indoor environment of the House of Commons Select Committee on the Environment.
- 4.3 Access to Medical Reports and Records Acts, 1988 and 1990, protecting employees by giving them the right to inspect records and reports on health aspects of their work capacity.

- 4.4 The Display Screen Equipment regulations, specifying obligations on employers to ensure that display screen users have safe and comfortable working conditions. Good ergonomic quality is required of both the equipment and the workplace. Appropriate eye care, information and training must be provided and working procedures planned. Software must be suitable for the task, easy to use and adaptable to the knowledge and experience of the operator. Systems must give feedback in response to input and there must be no secret quantitative or qualitative monitoring.

5 The Psycho-social Work Environment

Scandinavian research has established a positive link between employee control, health and efficiency. However, the 'big brother knows best' managerial attitudes and inertia of many bureaucrats with vested interests appears to be giving rise to increased stress levels, especially in women.

"There is widespread agreement that stress - executive or otherwise - has become a major issue. It ruins self-esteem, creates havoc with health, can even wreck marriage.

A Sunday Times report last month went so far as to suggest that the problem was reaching 'plague proportions'.

The computer is coming on strong as stress counsellor of the nineties, said the story, going on to explain how a Chesterfield-based firm has devised a stress-counselling program. Employees sit at the computer and give responses to a series of 75 questions. Their responses are then combined and the resulting analysis can be used by employers to help alleviate some of the causes of stress.

Apparently the computer program is in demand by private companies, health authorities, training centres, atomic energy plants and police forces". BP News April '92

Greater professionalism and training of managers will be required to increase the quality of leadership and so lessen the 'need' for this type of 'solution'.

REDEFINING "THE OFFICE"

Background

In the UK, traditional boundaries between various operating functions, such as engineering, sales, marketing and manufacturing, are breaking down as companies respond to the challenge of increased competition.

The shift from a manufacturing to an information-based economy has brought about a demand for retraining and cross-training, as well as an increased focus on strategic activities and tasks.

Teams of multidisciplinary professionals are focusing their efforts on internal users, customers, and suppliers in order to maximise quality effectiveness and speed.

Work is becoming increasingly multidisciplinary and interdependent. Organisations are acknowledging that to accelerate ideas, improve

products and shorten product development cycles employees need access to information, and the continuous exchange of ideas across hierarchical and functional boundaries.

Martha Whitaker, of HOK Architects, has identified in the USA the following interesting derivatives of the traditional commercial workplace. Some of these are now appearing in UK and I predict that the others may well follow:

1 "Flexplace"

Multiple work settings for employees working at many locations - in a set of facilities in Plant/Laboratory/Corporate offices, 'off-site' or at home. The facility can be a small workroom shared at different times, a quiet area with personal storage and PC, an office suite in a shopping centre or an at home office.

Users can vary from full time data entry operators to project managers, all integrated in the business and with their employee status maintained.

2 'Shared Space', 'Just-in-Time' Office

2 or 3 use at different times.

Users: | Field sales/engineers, auditors, consultants, project managers, data entry, telemarketing, shift workers.  
| Job share and part-time employees.

More space and facilities, more usage.

Standard user-adjustable equipment. (Seating, Desking, PCs etc)

Choice of work stations - conference, office, lounge area, mobile.

3 Free address, non-territorial office

10-15 employees share a single work area, no personal work space.

Shared files, library, lab space, work tables, quiet spaces. Encourages group and team interaction and 'fortuitous encounters' promoting shorter development cycles.

Users: Development engineers, task forces, teams.

4 Cave and commons

As in Free Address, but with individual private spaces.

5 Telecommuting

Home, client site, remote facility and Head Office. Flexible working with corporate base.

6 Media space

Individual and Team Spaces with video and audio recording, transmitting and receiving facilities.

Concept: 'You don't have to be there to be there'.

Goal - to overcome Time and Space.

Users: Development Engineers and Designers keeping in contact with remote collaborators and production managers, aiding 'fortuitous encounters'. It is thought that this will spread to many other occupations.

#### TECHNOLOGICAL ADVANCES

Electronic Data Exchange, character and voice recognition PCs, electronic paper filing and retrieval, combined with the rise of the computer numerate, professional manager and technician, will, I predict, lead to the demise of the word processor upper limb disordered 'secretary'.

Computer Assisted Facilities Management (CAFM) software is now being introduced in the UK to coordinate the physical workplace with the people in it, and their work.

Virtual reality may sound like science fiction fantasy but it is now a science fact. Over the next few years it could change the face of engineering and the petroleum industry. The design and construction process could occur in an artificial computer simulated reality rather than the material world. The potential for saving time and money and to embark on more complex projects will be huge. Tim Lawrence, Petroleum Review Feb 1992

I predict that these increasing demands and expectations for optimal, flexible and innovative indoor environments will lead to increasing recognition of a new trained and qualified profession - the facilities manager.

#### SUMMARY

In the limited time available I have attempted to give you some idea of the changing expectations for the indoor office environment in the UK - using environment in its widest sense. I predict that a considerable change will take place during this decade, although, no doubt, substantial pockets of traditional style will continue, giving we environmental practitioners plenty to concern us until the millenium arrives!



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